Portland State
UNIVERSITY

Emerging Technology
Social Indexing

ETM571 – Newman

July 27, 2011

Tina Swenson

Contents

Introduction

Social Indexing is related to on-line social networks. It is a new paradigm to personalize web content and make that personalization available no matter what device is browsing the Web. Social Indexing is also a new paradigm for developers. Standards are being developed such that web developers can maintain code on multiple platforms with minimal effort.

The Internet is traditionally an impersonal web of sites. When interacting with websites, the site has no concrete idea who the user is. It is not truly possible for these traditional websites to effectively customize content. Customization attempts have been made in the form of using cookies to remember what a person might have viewed on previous visits and other such methods.

In today's paradigm, web developers must maintain complex code for multiple platforms. This is extremely resource intensive (time to maintain and debug code). Social Indexing employs open standards such that minimal coding effort if required to implement social plug-ins on multiple platforms.

In 2010, Facebook launched a new way for external web developers to implement Facebook's Like button. Now, when developers implement the API, users will be able to see who of their Facebook friends might have Liked certain content on a web page. The image below is an example of social indexing. This CNN article is "Liked" by three of this user's Facebook Friends.

No login to CNN was required. This user could have visited this website for the first time ever and been given this level of personalization.

This is a breakthrough in content sharing technology. People's on-line social networks will now have visibility in to what a person “likes,” “tweets,” or “+1s” all over the web. It is a revolution for web developers and users affecting how information is shared across the web (not just with users in their on-line social networks, but with the companies hosting these websites).

The Problem

Today, most web sites are mostly impersonal. Very little personalized feedback is given to today's users. Users, especially those participating in on-line social networks, could have a much richer, meaningful on-line experience if web content was customized to a user.

To date, web developers have attempted to customize sites to users through the use of cookies. Cookies are used to save a user's location on their computing device. For example, Google's home page knows that Tina Swenson is currently located in Oregon, thus Oregon search results are given higher position. What Google doesn't know is what Tina Swenson is really interested in. Cookies are also used track what a person may have purchased in the past. This is helpful content, but users might want to know what their friends are buying, where they are shopping or which Thai food restaurant a friend enjoyed.

Figure 1 demonstrates today's example of socially relevant web sites. Notice that there are Diggs, Tweets, etc. The problem to the users with this feedback is that it lacks context. The user may not care at all that eighty-five people "dug" this article. Who are those people to the user? The user has no idea.

Figure 1 – Today's Impersonal Web Content.

Developers have also struggled with these customization attempts. It is a significant resource challenge to maintain web code for so many different platforms. Every time a new API is launched, developers are required to code and debug for many different platforms, at great expense to companies.

The Breakthrough

Recently, some social networking companies have made it possible for non-social-network websites to provide content that was socially relevant. The breakthrough is instantly personalized web content. In addition, the customized content follows the user seamlessly without regard to device type.

Facebook, in particular, solves this web-content-personalization problem by being as frictionless as possible (F8). One of the goals to making the web personal is to make it as simple as possible (frictionless) for both users and web developers to engage in the socially relevant content. For users, this means minimizing logins, exposing social network icons clearly and frequently. For developers, this means using a simple model for coding and maintaining websites.

Figure 2 is an example of a socially aware website. Notice the exploded view of the Like button and the images of people. These are people in this user's circle of Facebook friends who Liked this CNN article. That's the power of Social Indexing.

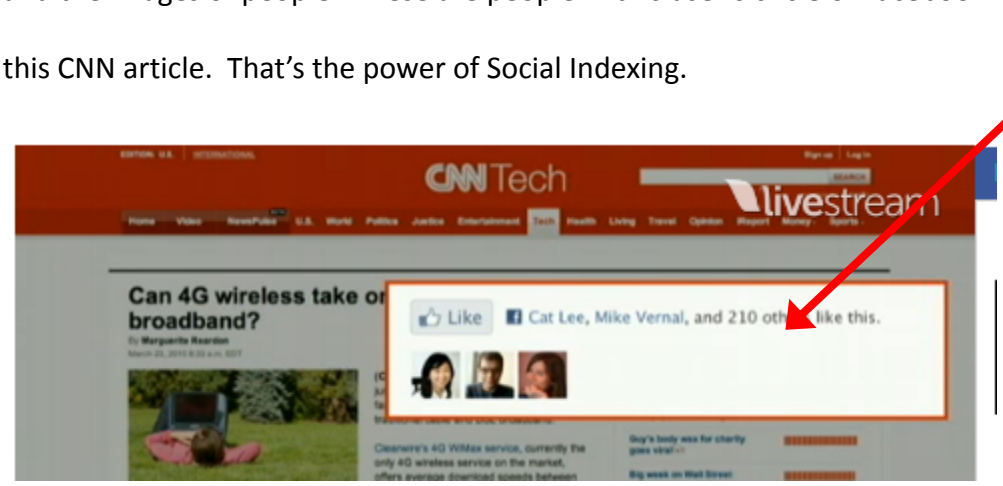


Figure 2 - Social Indexing Breakthrough

Google's version of Social Indexing is called +1. It also personalizes the web for users. When users +1 an item on the web, people in that user's Google+ profile will see that the user +1'd the item.

Figure 3- Google's +1

In addition to the user interface breakthrough, there is a breakthrough for web developers as

well. Social Indexing is also attempting to standardize how developers implement social plug-ins. This standardization minimized the resources required to implement and maintain social plug-ins.

How it Works

The following technical descriptions are based largely on Facebook's implementation of Social Indexing. Facebook Platform is the set of developer technology used to generate personalized websites. Described here include history and some technical details surrounding Facebook's implementation of Social Indexing.

In 2007, a small startup company called FriendFeed invented the Like button 

(Social Indexing). Two years later, Facebook saw a place for the Like button in their world, so FriendFeed was acquired. The Like button has been growing in popularity and many major websites today incorporate Like and other social plug-ins similar to it. In late 2008, Facebook introduced the Like button to the world along with a concept called Connect. These two technologies combined to allow Liked third-party web content to be reflected in Facebook users' profiles (Facebook Platform).

In 2010, Facebook took Like to the next level. Facebook saw the need for websites to provide feedback to users that is relevant to the user. Mark Zukerberg announced major modernization to the Facebook Platform in 2010 (F8). The goal of these developer tools is to easily create personalized web content for all Facebook users. Facebook wants websites (not just their

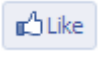
social networking sites) to provide instantly personalized content for users. Even if a user has never visited a site before, that user's interests (as provided in the user's social network profiles) has direct input into the personalized nature of that site. This is one example of what Facebook means to have a frictionless experience (F8).

Facebook applies frictionless personalization to web developers, too. An iframe in the form of a single line of HTML code is all that is required to put the Like button on the developer's site and have it be armed to give users that personalized web site content. Additionally, this single like of HTML code is the same across multiple platforms. This makes implementation and maintenance of this social-plugin much simpler than it was in the past (F8).

One of the foundational pieces of Facebook Platform is the Open Graph Protocol. This protocol puts people at the center of web, Open Graphs makes the semantic connections between people and objects on the web. Every time a user clicks the Like button on a third-party web page, a connection is made between that page and the user. These Likes generate a graph for the user. That graph is used to make connections between many users and that web page. This is done via structured data defined by the web developer and is used to define how that web page is represented on Facebook (Open Graph Protocol).

Figure 4 - Facebook Open Graph

Social Plug-ins, especially the Like button, are critical to Social Indexing. These are the visual cues to the people on the web to indicate their approval of web content. Facebook social plug-ins include the Like Button, Login Button, Activity Feed, and Recommendations to name just a few. An important goal of the 2010 Facebook Platform is to make all of these plug-ins easy to implement. Below is a description of the Like and Login buttons, describing the ease of implementation.

The Like button 

is the main vehicle developers use to give users that instantly personalized experience. After the developer configure the Open Graph Protocol and the structured tags needed to define their website to Facebook, the developer can then drop the

Like button onto the web page via an iFrame (an highly supported HTML structure that contains another document [HTML <iframe> Tag]) or Java SDK and a single line of HTML code (Like Button).

```
<fb:like href="http://developers.facebook.com/" width="450" height="80"/>
```

Another social plug-in that help reduce friction is the Login button 

. This plug-in displays both a login and the faces of all the user's Friends who have also signed up for the web developer's site. Similar to the Like button, the Login button can be implemented with Java SDK and the `<fb:login-button>` XFBML tag (Login Button).

Class Concepts

Part of learning about emerging technologies, such as Social Indexing, is connecting these technologies to concepts taught in this course. Bibliometrics, speciation, and diffusion of technology are key concepts covered in class and deserve to be discussed.

Bibliometrics

A document search of the several databases yielded the below table. Searched databases were Google Scholar, ETM Business Source Primer, and the CS ACM Digital Library. A search of the US Patent Office yielded zero patents.

Documents surrounding Social Indexing began to appear in 2007. Every year, a few more documents appear surrounding the topic. The short timeframe of 4 years and the sparseness

of documentation lead this author to conclude that this technology is still emerging and very new.

Year	Cumulative number of papers
2011	21
2010	16
2009	2
2008	2
2007	0
2006	0

Speciation

Social Indexing evolved out of the combination of on-line social networks and the impersonal nature of today's web. The result is a new form of the web. Personalized web content is the new species.

Diffusion

This emerging technology is in the Introductory stage. There is little in the way of patents and official papers on the topic of Social Indexing. As demonstrated above, Bibliometrics shows us we are early in the adoption of the technology. This author speculates that Rapid Adoption will be in steep ascent by 2016, reaching saturation by 2021.

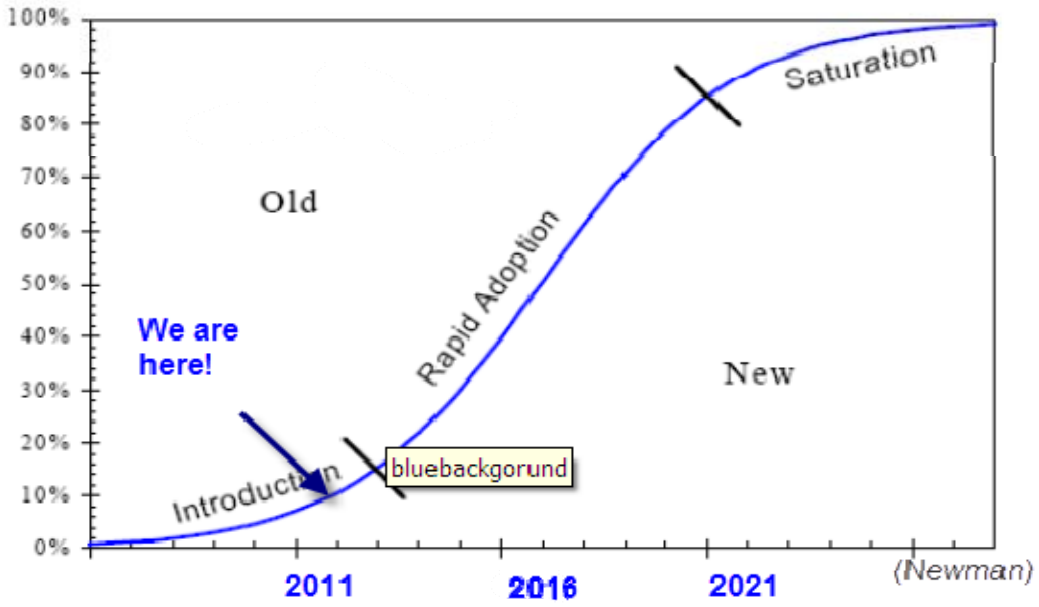


Figure 5- Diffusion

The Chasm

Again, Bibliometrics shows us that we are in the Early Market, in the Early Adopters phase, well before crossing the Chasm. This author is not sure that the Chasm will be crossed. Because not everyone demands an instantly personalized web, it could be a likely eventuality that Social Indexing ends up an "isolated island of application" (Day). But given that major companies, such as Microsoft and Google are publicly investing time and resources into implementing Social Indexing, it seems possible that this is a new paradigm for the web. People like this

author may someday discover that the web experience is indeed very poor without instantly personalized content. At that time Social Indexing will have indeed crossed the chasm.

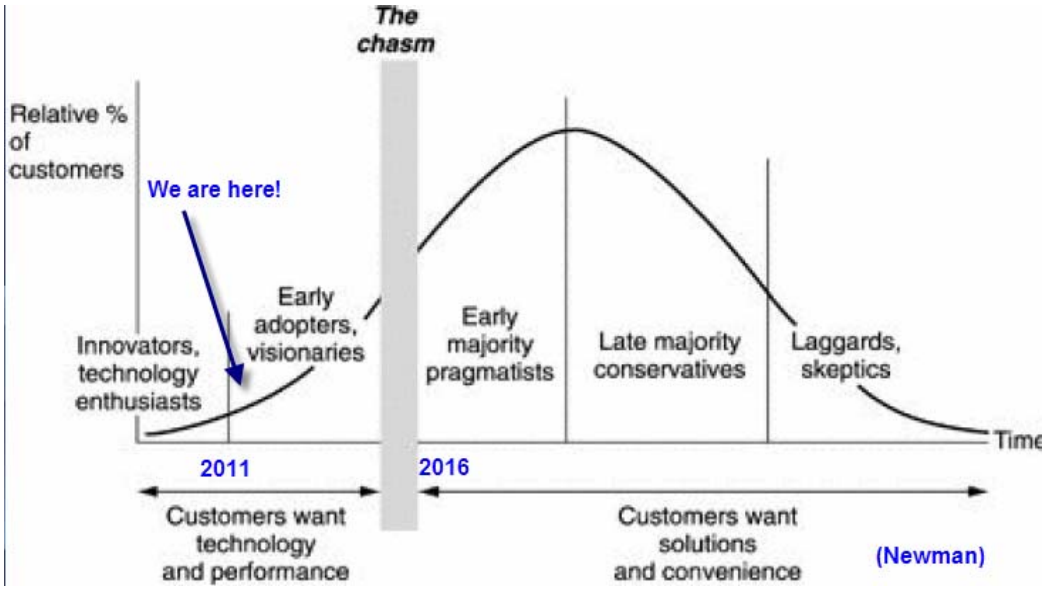


Figure 6- Crossing the Chasm

Potential Applications & Major Players

Social Indexing could revolutionize the web experience, both for users and developers. Today, it is being applied in such a way that people can see what members of their social networks are interested in. For the future, Social Indexing could be used for highly refined and personalized web searching, research and collaboration projects in business and academia. This author can also imagine a "Buy Button." This social plug-in would enable users to make online purchases, with all relevant data needed to make that purchase saved in their social networking site.

There are also risks and difficulties associated with this emerging technology. As stated earlier, if this technology cannot cross the chasm, it will end up in isolation. People need to believe that they need personalized websites that Social Indexing provides. This begs the question, what if users end up rejecting online social networks? What if users get tired of always being tracked or receiving this constant personalized feedback? This author can imagine issues surrounding privacy. Privacy rules could even kill this emerging technology, preventing it from crossing the chasm. That could also kill or keep this new technology away from the mainstream market. In addition, how does a user know all of this data related to the Open Graph is being saved securely? What if there is a security breech and one's profile is hijacked? With regard to frictionless usage of Social Indexing, how does one keep personal separate from professional?

Major players for Social Indexing include Facebook, Microsoft, Google, and Twitter. There are also smaller companies involved in this emerging technology – Hunch, Digg, Stumbleupon, and

MySpace name a few. Some of them may be purchased by these major players (as happened with FriendFeed – the creator of the Like button) if their approach to Social Indexing is attractive.

Conclusion

Social Indexing is still in the Early Market, being used by the Visionaries of the web world, both users and developers. The breakthrough aspect with respect to developers could be the driving force behind wide adoption of this emerging technology. Ease of programming and increasing web traffic to sites (to increase company revenue) are major factors that will drive the the adoption of Social Indexing. Risks such as privacy law and the potential rejection of online social networking put this emerging technology's diffusion at risk. Today's Social Indexing visionaries (companies, web developers and users) must convince the mainstream market that instantly personalized web (and the future applications that emerge) is worth the paradigm shift. This author speculates that if the technology can cross the Chasm, then the Rapid Adoption phase will be in full swing by 2016.

Appendix A – List of Figures

Appendix B – Presentation

Portland State
UNIVERSITY

Emerging Technology
Social Indexing

Tina Swenson
ETM 571 – Dr. Newman
July 27, 2011

The Problem – user's perspective

- The Internet is impersonal.
- Web content lacks the context of online social networks.
- Websites are minimally customized for users.
- Data mining user activity occurs without user's knowledge.

The Problem – developer's perspective

- Personalization, even in its limited form, doesn't follow the user from device to device.
- Programming social plug-ins for multiple platforms is very time consuming.

Prior Solutions

- Cookies and other methods to remember a person's online behavior or location.
- Google's search algorithms, including spatial locality.
- Websites today: But who are these people? Do I really care that there are 85 Diggs from strangers?

Breakthrough Tech

- Connecting a person's interests to yield web content specific to that person's online social networks.
  - Via technology such as
    - Facebook's Like
    - Google +1
- A Social Web!
  - Instantly personalized web sites.

Breakthrough Tech

- Social Indexing uses standardized APIs which simplifies web development
  - Enabling easier programming of multiple platforms!
- Social Indexing drives web traffic, which drives up revenue.

Social Indexing – an example

- Google +1

http://www.youtube.com/watch?v=4RyY2-ofP4g

How it Works

- Focus on Facebook's technology.
- F8 Video (11:15 & 17:10): http://apps.facebook.com/feightlive/

How it Works

- Facebook Platform
  - Open Graph Protocol
    - Implemented in an open standard
    - Makes connections between a person and objects on the web.
    - Makes use of structured data via tags.

How it Works

- Facebook Platform
  - Social Plug-ins
    - Like Button, Login Button, Recommendations, Send Button, Activities List, others.
    - Drop into developers site via iFrame or Java SDK:

```
<fb:like
 href="http://developers.facebook.com/"
 width="450" height="80"/>
```

Bibliometrics

Year	Cumulative number of papers
2011	21
2010	16
2009	2
2008	2
2007	0
2006	0

Sources: Google Scholar, ETM Business Source Primer, CS ACM Digital Library

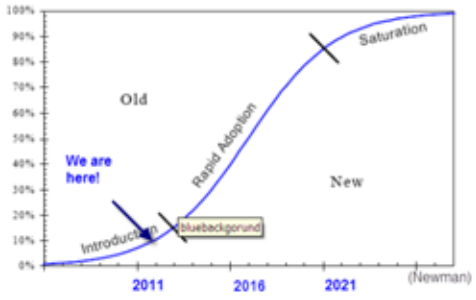
No patents found.

Speciation

- Social Indexing evolved out of the combination of on-line social networks and the impersonal nature of today's web.
- The result is a new form of the web. Personalized web content is the new species.

Diffusion

- Timeline to adoption



The Chasm

Potential Applications

- Today we have socially enabled web content.

- Future:
  - Personalized web search results.
  - Search results linking what others are doing.
  - Research partners
  - Collaboration
  - On-line purchases via Social Indexing technology.

Risks and Difficulties

- What if people get tired of being tracked?
  - Reject major social networks.
- What privacy laws might impact content sharing?
- Can socially based searches have a negative impact on one's reputation?
  - Business life vs. personal life
- What happens when mal-ware figures out how to disrupt social indexing?
  - Loss of trust in results?
  - Loss of ad revenue, thus loss of profit.
  - Profile impersonation!
- How safe is the data?
- Can one's graph of the personalized web be utilized against her?

Major Players

facebook

Microsoft

twitter

Google

- Developers involved:

Conclusions

- Social Indexing is very early in the market!

Speculation:

- Mainstream by 2016 or sooner?
- Who will get the tech past the Chasm?
  - Web developers (easier programming)
  - Company owners (increased revenue from the personalized web)
  - Visionaries who can help influence the "rest of us" to WANT a personalized web experience!

Thanks!

- Questions and Comments

Works Cited

Day, George S., et al. *Wharton on Managing Emerging Technologies.* Hoboken, New Jersey: John Wiley & Sons, Inc, 2000. Print.

"F8 Keynote." *apps.facebook.com.* Facebook. April 21, 2010. July 25, 2011.

"Google Business: Introducing the +1 Button." Youtube.com. YouTube, LLC. March 7, 2011. July 25, 2011.

"HTML <iframe> Tag." *w3schools.com*. w3schools.com. 2011. July 26, 2011.

"Like Button." *developers.facebook.com.* Facebook. 2011. July 26, 2011.

"Login Button." *developers.facebook.com.* Facebook. 2011. July 26, 2011.

Newman, Paul PhD. *ETM 571 – Lecture 4*. Portland State University. July 14, 2011. Lecture.

"Open Graph Protocol." *developers.facebook.com.* Facebook. 2011. July 26, 2011.

"Social Indexing." *Technologyreview.com.* MIT Technology Review. May/June 2011. July 25, 2011.